TO: Andrew Dolinar

FROM: Damian Aquino, Reg. No. 54964

PROPOSED CLAIM AMENDMENTS FOR CONSIDERATION

(For Discussion Purposes Only)

1. (Currently amended) A method for enabling combustion-assisted engine starting in a variable displacement engine, comprising:

adjusting a throttle valve to provide an air flow rate to an engine of a vehicle that is sufficient to create starting torque;

injecting fuel that is sufficient to create said starting torque into a selected cylinder of said engine during an intake stroke of said cylinder;

~~selectively~~ disabling a spark plug of said selected cylinder;

~~selectively~~ disabling an intake and exhaust valve ~~of said~~ cylinder ~~in~~ said so as to trap said fuel in said selected cylinder while variable displacement engine continues to run; and

deactivating said variable displacement engine after disabling the spark plug and the intake and exhaust valves of said selected cylinder.

17. (Currently amended) A method of operating a variable displacement engine comprising:

sensing a low load condition on said variable displacement engine;

deactivating at least one selected cylinder of said variable displacement engine to substantially prevent air flow through said at least one selected cylinder in response to said low load condition;

injecting fuel into said at least one selected cylinder while said at least one selected cylinder is deactivated;

operating said variable displacement engine in a partially displaced operating mode with said fuel in said at least one selected cylinder while air is substantially prevented from flowing through the at least one selected cylinder; and

igniting the fuel in said at least one selected cylinder to operate[[d]] said variable displacement engine in a fully displaced mode.

SUMMARY OF ARGUMENTS

With respect to claim 17, claim 17 now recites "in response to said low load condition." Tanaka does not disclose preventing air flow in a cylinder in response to a low load condition.

Tanaka discloses individually controlling torque in engine cylinders by determining a target torque and controlling intake and exhaust valves according to the target torque. In cases of low-load operation, the intake and exhaust valves, throttle actuator, and fuel injection valve are controlled to minimize fuel consumption while satisfying target cylinder torque (column 13, lines 13-22). Fuel injection is set to an amount corresponding to the target cylinder torque. However, air intake is not reduced, and exhaust gas recirculation (EGR) is increased in order to create a lean air-fuel ratio (column 13, lines 23-29). The throttle valve is set to a "fully-open" state (column 13, lines 35-37).

Tanaka does not disclose deactivating a cylinder to substantially prevent air flow through the cylinder in response to the low load condition. In contrast, Tanaka discloses maintaining the throttle valve in the fully-open state, as well as increasing EGR.

With respect to claim 1 (and analogously, claims 6 and 12), Ule discloses disabling engine ignition prior to stalling in order to trap a combustible charge in "the appropriate cylinders" (column 19, lines 17-20). When the engine is stalled, the intake and exhaust valve rotaries continue to rotate, and cylinder pistons operate accordingly. The engine is restarted by delivering ignition to the cylinders "whose pistons are in a position to crank the engine in the proper direction" (column 19, lines 10-13). In other words, the computer has no control over which cylinders trap the combustible charge. The computer disables

ignition and allows the engine to stall. Subsequently, the computer delivers ignition to cylinders that happen to be in the proper position, and that include a combustible charge. This method does not ensure that a cylinder will trap a combustible charge. Therefore, it may be necessary to inject fuel air mixture into the next two or three cylinders in the firing sequence after the engine is stalled in order to ensure that the cylinders will trap a combustible charge (column 10, lines 20-36).

Ule does not disclose selectively deactivating one or more cylinders, and subsequently igniting a fuel/air charge in said one or more cylinders. In other words, Ule does not disclose a method that guarantees that a fuel/air charge sufficient to create starting torque will be trapped in a minimum number of cylinders before deactivating an engine. Further, Ule does not disclose disabling an intake and exhaust valve of a selected cylinder. Instead, Ule discloses stalling the engine and allowing the intake and exhaust rotaries to continue to rotate until stalling is complete.

In contrast, Applicant teaches a method that is performed on one or more selected cylinders to ensure that at least one cylinder is available for combustion-assisted starting. Cylinders with deactivated intake and exhaust valves and a disabled spark plug maintain a trapped air/fuel charge regardless of continuing crankshaft revolution (paragraph [0034] of the Application). Applicant's method does not rely on a mere possibility that the engine will stall with a combustible charge trapped in a cylinder.